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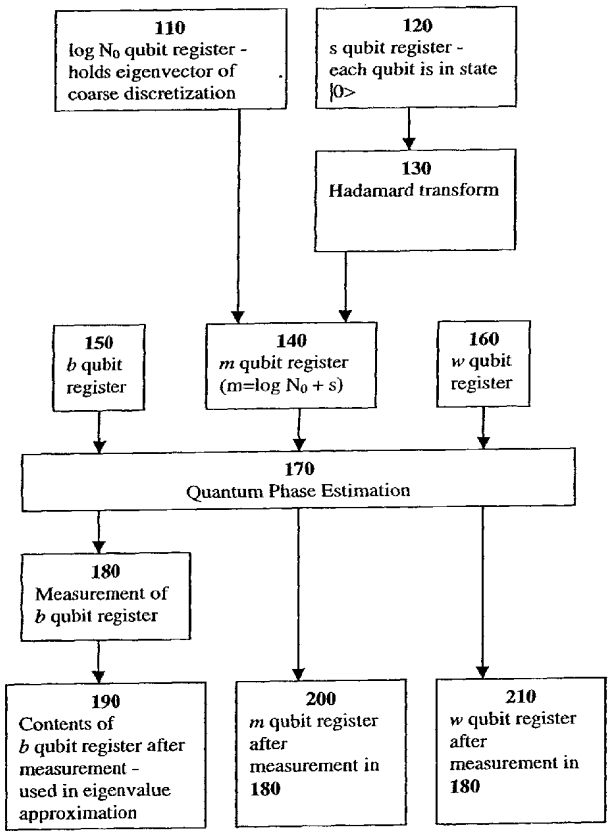
(54) Title: FAST QUANTUM MECHANICAL INITIAL STATE APPROXIMATION



(57) Abstract: A system and method efficiently prepare the initial state of q quantum computer required by the eigenvalue approximation method of Abrams and Lloyd. The system and method can be applied when solving continuous Hermitian eigenproblems, e.g. the Schrödinger equation, on a discrete gird, and allows for efficient calculation of their eigenvalues with quantum computers. A system and method efficiently prepare an approximate initial state (not limited to eigenvectors) of a quantum computer required by a quantum algorithm as input.

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